

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification : <b>C02F 1/00, 1/28</b>		<b>A1</b>	(11) International Publication Number: <b>WO 00/43319</b>  (43) International Publication Date: <b>27 July 2000 (27.07.00)</b>
(21) International Application Number: <b>PCT/US00/01671</b> (22) International Filing Date: <b>26 January 2000 (26.01.00)</b>  (30) Priority Data: 60/117,266            26 January 1999 (26.01.99)    US 09/480,813           10 January 2000 (10.01.00)    US  (71) Applicant: <b>KIMBERLY-CLARK WORLDWIDE, INC.</b> [US/US]; 401 N. Lake Street, Neenah, WI 54956 (US).  (72) Inventors: <b>FISH, Jeffrey, Eldon; 2405 Cammie Wages Road, Dacula, GA 30019 (US). POIRIER, Malcolm, Daniel; 3924 Upland Way, Marietta, GA 30066 (US). McGRATH, Kevin, Peter; 335 Hermitage Trail, Alpharetta, GA 30004 (US). WILLIAMSON, Bruce, Scott; 2020 Compass Pointe Drive, Alpharetta, GA 30005 (US).</b>  (74) Agents: <b>KLEMBUS, Nancy, M. et al.; Kimberly-Clark Worldwide, Inc., 401 N. Lake St., Neenah, WI 54956 (US).</b>		(81) Designated States: <b>AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</b>  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
(54) Title: <b>WATER FILTRATION PITCHER WITH PRESSURE FILL</b>			
(57) Abstract  <p>The present invention relates to a fluid filtration device including a pitcher having a fluid reservoir. A cover may be provided which is adapted to engage the pitcher. An opening may be disposed in the cover, the opening adapted to sealingly engage a pressurized fluid source such as a kitchen faucet or sprayer so that fluid flows into the opening of the cover under pressure. A filter support member may be releasably attached to the cover so that the filter support member is disposed within the pitcher, the filter support member including at least one aperture through which fluid may exit the filter support member. A filter may be secured within the filter support member so that fluid flowing into the opening of the cover must flow through the filter prior to flowing out of the aperture in the filter support member and into the fluid reservoir.</p>			

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

## WATER FILTRATION PITCHER WITH PRESSURE FILL

### Field of the Invention

The present invention relates generally to a water filtration pitcher, and more particularly to a water filtration pitcher adapted to engage a pressurized fluid source.

### Background of the Invention

5 As consumers become more health conscious, there is a heightened interest in increasing the quality of water that is utilized for human consumption. In response to this interest, there is ongoing effort to develop systems which improve water quality by filtering the water to remove contaminants such as chlorine, iron, biological and organic contaminants, microorganisms, lead, and the like which may affect the color, taste, odor  
10 and potability of water.

A variety of filtration systems are currently available that assist in reducing the contaminants in water prior to use or ingestion. Such systems may include a replaceable filter positioned within some type of housing such as a bottle, canteen, pitcher, counter-top, faucet-mounted device or the like.

15 It is also desirable that a filtration system filter fluid quickly enough to provide filtered fluid in a timely manner to the user. In some filtration systems, water flowing through the filter may flow at a slower rate than is desired. For example, when certain filtering media, such as block activated carbon, is utilized, a particular amount of pressure is required to force fluid to flow through the media. To increase the usefulness of these  
20 devices, the fluid may be introduced to the filter under increased pressure so that the fluid flows through the filter at a faster rate. In such systems, a user will have access to filtered water in a shorter period of time.

Some of the currently available filtering systems provide an indication as to when the useful life of the filter has been reached, and the filter must be replaced. In many  
25 systems, it is desirable to provide an indication that a filter has reached the end of its useful life. If a filter is utilized after its effectiveness has diminished, contaminants that have been captured by, and are contained within, the filter may be reintroduced into water flowing through the filter.

Thus, there remains a need for a water filtration system that filters fluid in a timely  
30 manner and also provides a clear and reliable indication that the filter should be replaced.

### Summary of the Invention

The present invention is directed to a fluid filtration device including a pitcher having a fluid reservoir. A cover may be provided which is adapted to engage the pitcher. An

opening may be disposed in the cover, the opening adapted to sealingly engage a pressurized fluid source such as a kitchen faucet or sprayer so that fluid flows into the opening of the cover and the pitcher under pressure.

5 A filter support member may be releasably attached to the cover so that the filter support member is disposed within the pitcher, the filter support member including at least one aperture through which fluid may exit the filter support member. A filter may be secured within the filter support member so that fluid flowing into the opening of the cover must flow through the filter prior to flowing out of the aperture in the filter support member and into the fluid reservoir.

10 Other objects, advantages and applications of the present invention will be made clear by the following detailed description of embodiments of the invention and the accompanying drawings wherein reference numerals refer to like or equivalent structures.

#### **Brief Description of the Drawings**

15 **Figure 1** is a perspective view of an embodiment of a filtration system according to the present invention connected to a pressurized source of fluid.

**Figure 2** is a perspective view of another embodiment of a filtration system according to the present invention.

20 **Figure 3** is a perspective view of yet another embodiment of a filtration system according to the present invention.

**Figure 4** is a perspective view of an embodiment of the cover, filter and filter support member of a filtration system according to the present invention.

**Figure 5** is a side view of still another embodiment of a filtration system according to the present invention.

25

#### **Detailed Description**

In response to the foregoing problems and difficulties encountered by those of skill in the art, the present invention is directed to a filtration system 10, an embodiment of which is depicted in **Figure 1**. The filtration system 10 shown therein includes a receptacle such as a pitcher 12 that may include a reservoir 14, a handle 16 and a spout 20. A cover 18 may be provided that engages an upper portion (or open end) of the pitcher 12 and, in selected embodiments, may engage the pitcher 12 so as to form a watertight seal.

35 A variety of materials may be utilized for the pitcher 12 and/or the cover 18, including glass, plastics, metals, ceramics and any combination thereof. In selected embodiments, the pitcher 12 may be produced from a plastic such as, for example, polyethylene, polyvinylchloride, and polypropylene. In certain of such selected

embodiments, at least a portion of the pitcher 12 and/or the cover 18 may be produced from a transparent or translucent material such as glass or plastics such as, for example, acrylic, polycarbonate and polyvinylchloride.

5 A fill opening 22 may be formed in the cover 18. The fill opening 22 is adapted to sealingly engage a pressurized source of fluid such as, for example, a faucet or a sprayer. In some embodiments, the fill opening 22 adapted to permit fluid to flow into the opening of the cover and through to the pitcher under pressure.

As shown in Figures 1 and 3, a sprayer 26 may engage the fill opening 22 formed in the cover 18. As shown in Figure 2, a faucet 32 may also engage the fill opening 22. 10 certain embodiments, the faucet 32 may further include an attachment 34 that is adapted to assist engagement of the faucet 32 to the fill opening 22. The attachment 34 may include an extensible portion 36 such as, for example, an expandable and flexible hose. The extensible portion 36 may be lowered to engage the fill opening 22 and, when not in use may be compressed and/or raised so that the attachment 34 does not interfere with 15 subsequent use of the faucet 32.

To enhance the connection between the pressurized fluid source and the fill opening 22, the pressurized fluid source, the attachment 34, and/or the fill opening 22 may be adapted to cause the pressurized fluid source to releasably lock to the fill opening 22. For example and as shown in Figure 2, one or more detents 24 may be provided to securely 20 engage the extensible portion 36 of the attachment 34 to the fill opening 22 of the cover 18. In such an embodiment, the attachment 34 may be pressed into the fill opening 22. The pitcher 12 may then be rotated with respect to the pressurized fluid source so that the detents 24 engage the extensible portion 36. In other embodiments, the attachment 34 may be rotated, rather than the pitcher 12.

25 A variety of other mechanisms may be utilized to releasably secure the faucet 32 to the cover 18, such as, for example, flexible lock arms, screw threads, quick disconnect couplings, other snap-fit or press-fit mechanisms, or the like.

The cover 18 may further include a filter support member 40. In some embodiments, the filter support member 40 may be attached to the cover 18 and/or the pitcher 12 so that 30 the filter support member is suspended in the interior of the pitcher 12 from the underside of the cover 18. As best shown in Figure 4, the filter support member 40 may include a plurality of apertures 48.

The filter support member 40 may be releasably and sealingly attached to the lower surface of the cover 18. In such an embodiment, it may be desirable to position a seal or 35 gasket-like material between the support member 40 and the lower surface of the cover 18 to assist in creating an air- and water-tight seal between the filter support member and

the lower surface of cover 18. The filter support member 40 may be attached to the lower surface of the cover 18 by a variety of mechanisms, such as, for example flexible lock arms, screws, and the like.

When the filter support member 40 is sealingly engaged to the lower surface of the cover 18, a chamber 44 is formed. A filter 46 may be positioned within the chamber 44 so that fluid entering the fill opening 22 must flow through the filter 46 before exiting the filter support member 40 through the apertures 48. Such filtered fluid collects in the reservoir 14. In selected embodiments, the apertures 48 may include one-way valves so that fluid may only flow out of the apertures 48. In this manner, filtered fluid within the reservoir 14 may not flow back into the filter support member 40.

To enable the filtration system 10 to function properly, vents may need to be variously positioned in the pitcher 12, the cover 18, and the filter support member 40. As shown in Figure 5, a vent 30 is positioned in the cover 18 and may be positioned in the vicinity of the handle 16. In such an embodiment, the interior of the handle 16 may be in fluid communication with the reservoir 14, thus venting the reservoir 14.

Another embodiment of the present invention is shown in Figure 5. In such an embodiment, the sprayer 26 engages the fill opening 22 so that the forwardmost end of the sprayer is positioned within the chamber 44 of the filter support member 40. In such embodiments, the filter 46 is positioned within the filter support member 40 so that fluid flowing from the sprayer 26 flows onto the filter 46. A vent 30 may be provided in an upper portion of the pitcher 12. The vent 30 may, in certain embodiments, be adapted to permit air to flow out of the pitcher while inhibiting the flow of filtered fluid through the vent 30.

In certain embodiments, an indicator may be provided which indicates when the useful life of the filter 46 has been reached. Although a wide variety of indicators may be utilized with the present invention, an indicator suitable for use with the present invention may indicate the number of times the pressurized fluid source has been engaged to the fill opening 22. In such a system, the number of times the fluid source has been engaged to the fill opening 22 or pitcher 12 may be utilized as an approximation of the remaining life of the filter 46. Based on this approximation, a visual or audible indication may be given to a user. In the embodiment depicted in Figure 1, the indicator 50 displays a visual indication to convey to the user the amount of fluid (as approximated by the number of times the fluid source has been engaged to the fill opening 22) which has been filtered by the filter 46. When the filter 46 is replaced, the indicator may be reset or replaced.

Once the filter 46 has reached the end of its useful life, the filter 46 may be replaced with a new filter or may be reused upon reconditioning of the filter 46 to restore its filtering properties. To accomplish this, the filter support member 40 may be detached

from the lower surface of the cover 18, the filter 46 removed therefrom and a new filter placed within the chamber 44 prior to reattachment of the filter support member 40 to the cover 18. In other embodiments, the cover 18 and filter support member may be a single piece, the filter 46 being contained therein. In such embodiments, the cover 18, filter support member 40 and filter 46 may be discarded when the filter 46 has reached the end of its useful life and replaced with a new filter support member, filter and cover.

A variety of filters may be utilized in the present invention. In some embodiments, the filter 46 may include a charge-modified nonwoven web, but may alternately include materials such as, for example, block carbon, granular carbon, various membranes, and the like.

While the invention has been described in detail with respect to specific embodiments thereof, it will be appreciated that those skilled in the art, upon attaining an understanding of the foregoing, may readily conceive of alterations to and variations of the embodiments disclosed herein. Such alterations and variations are believed to fall within the scope and spirit of the present invention and the appended claims.

What is claimed is:

1. A fluid filtration device comprising:
  - a container having a fluid reservoir;
  - 5 a cover adapted to engage at least a portion of the container;
  - an opening disposed in the cover, the opening adapted to sealingly engage a pressurized fluid source so that fluid flows into the opening of the cover under pressure;
  - a filter releasably attached to the cover so that fluid flowing through the opening must flow through the filter prior to flowing into the fluid reservoir; and
  - 10 an indicator in communication with the opening that indicates the number of times the pressurized fluid source has been engaged to the opening.
2. The device of claim 1 wherein the cover is at least partially formed of a plastic material.
- 15 3. The device of claim 1 wherein the filter includes granular activated carbon.
4. The device of claim 1 wherein the pressurized fluid source is a sink sprayer.
- 20 5. The device of claim 1 wherein the pressurized fluid source is a kitchen faucet.
6. The device of claim 1 wherein the container is a pitcher.
7. A fluid filtration system comprising:
  - 25 a pitcher having an open end and a fluid reservoir;
  - a cover adapted to engage the open end of the pitcher so that at least a portion of the cover is disposed within the pitcher;
  - a filter;
  - an opening disposed within the cover, the opening adapted to engage a
  - 30 pressurized fluid source, the filter disposed at least partially within the cover so that fluid flowing into the opening from the pressurized fluid source must pass through the filter before entering the fluid reservoir.
8. The device of claim 7 wherein the cover is at least partially formed of a plastic material.
- 35 9. The device of claim 7 wherein the filter includes granular activated carbon.



10. The device of claim 7 wherein the pressurized fluid source is a sink sprayer.
11. The device of claim 7 wherein the pressurized fluid source is a kitchen faucet.

5

1/5

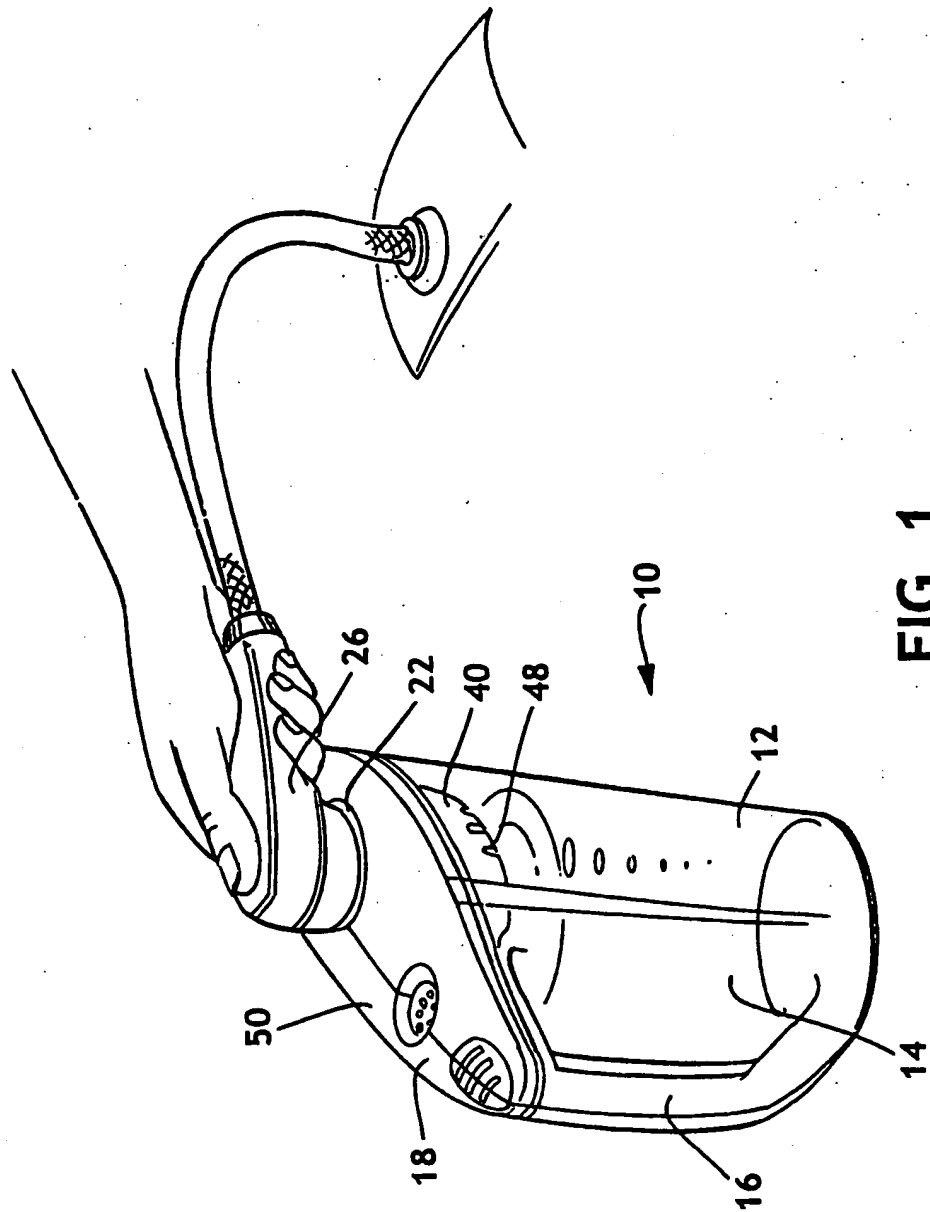


FIG. 1

2/5

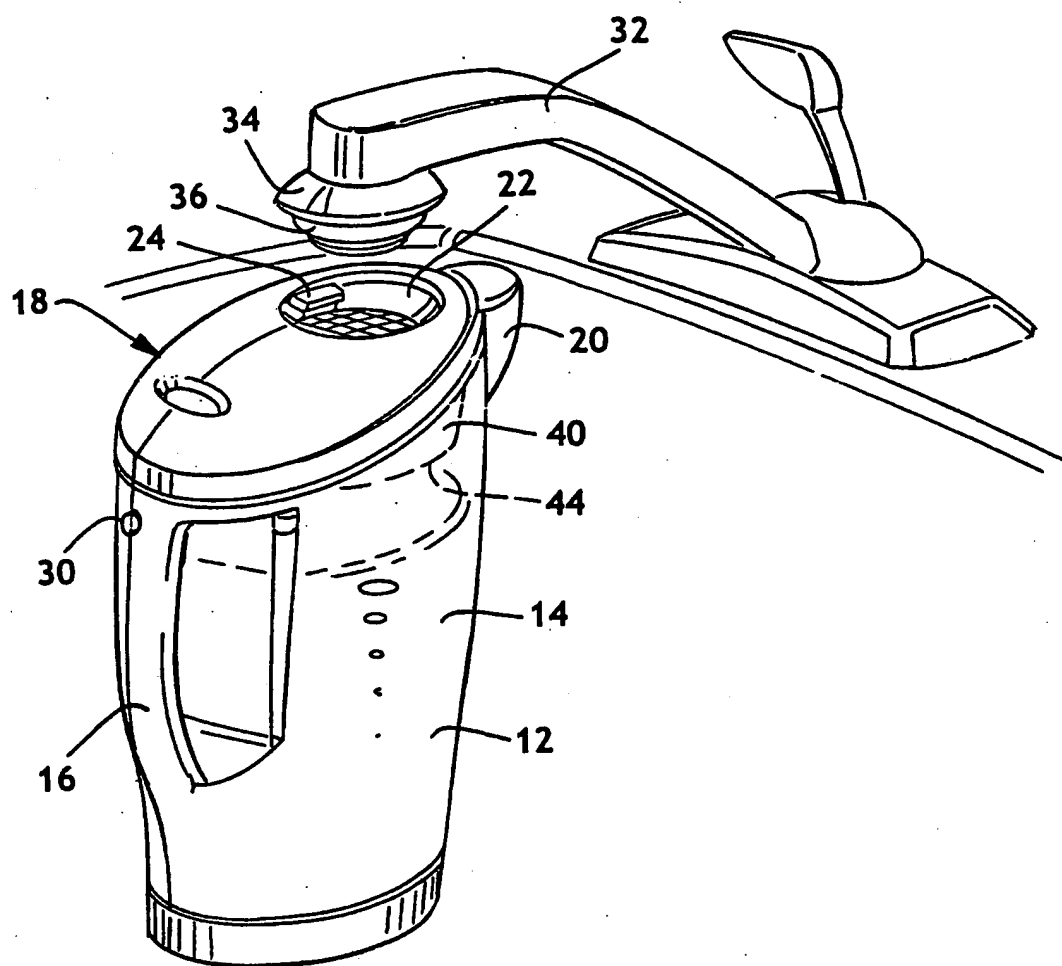


FIG. 2

3/5

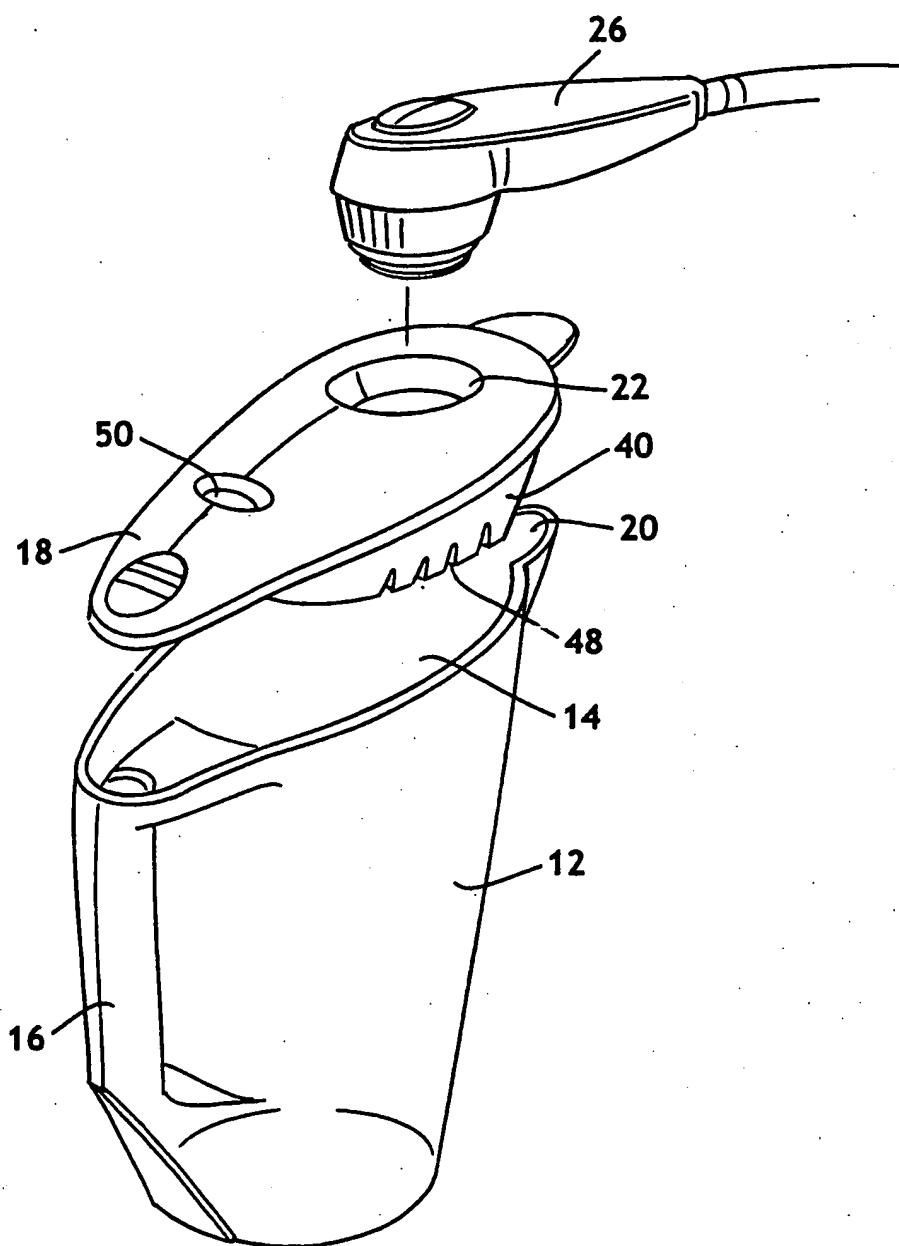


FIG. 3

4/5

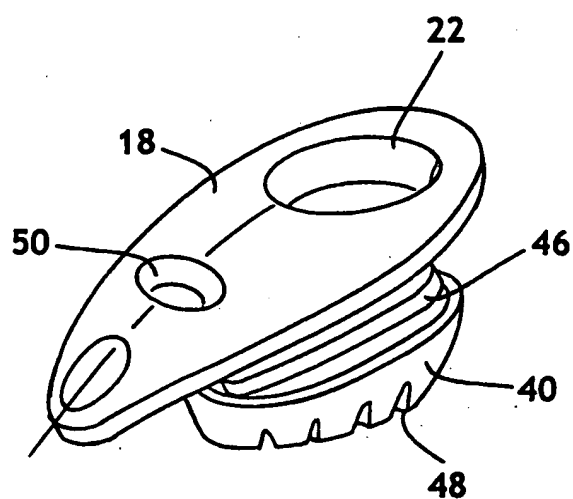


FIG. 4

5/5

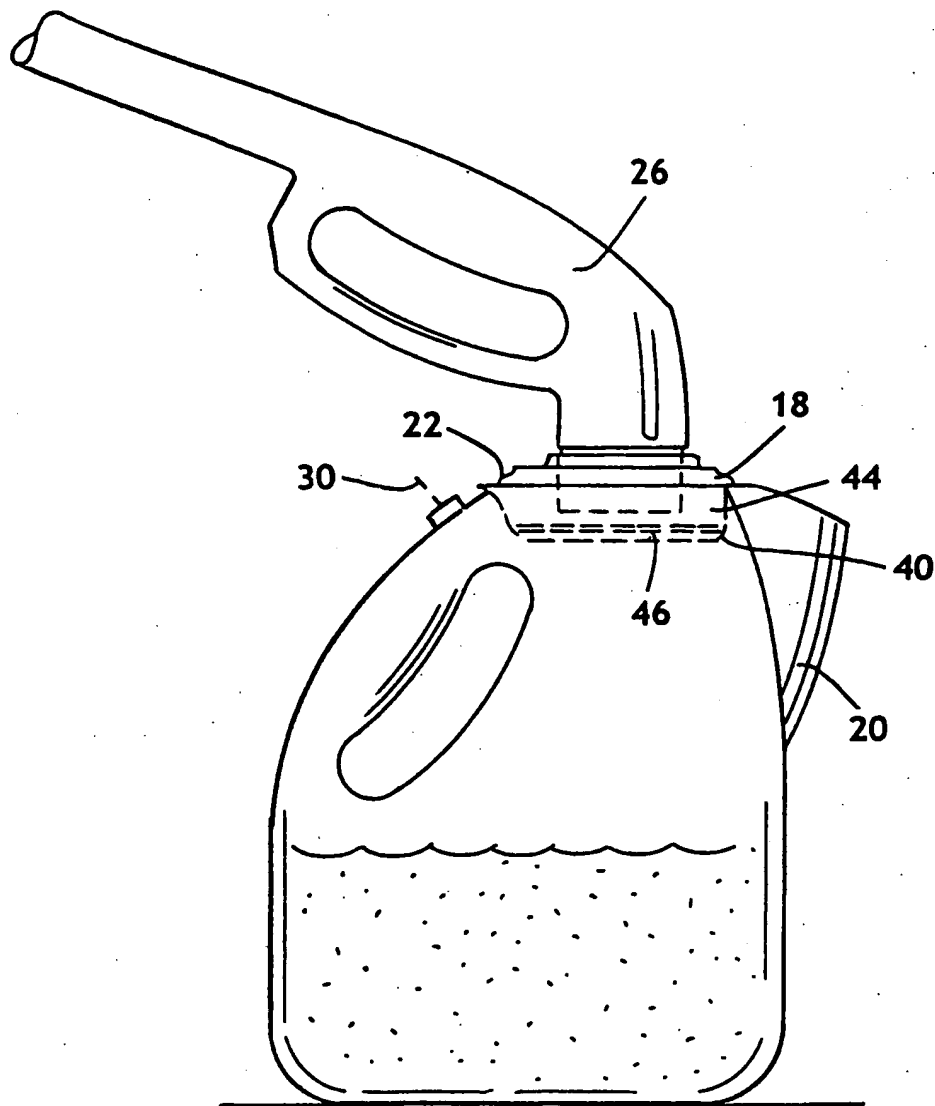


FIG. 5

# INTERNATIONAL SEARCH REPORT

Int'l. Application No  
PCT/US 00/01671

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C02F1/00 C02F1/28

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C02F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 776 956 A (GANNAWAY RICHARD M) 11 October 1988 (1988-10-11) the whole document	1-11
A	US 5 190 643 A (DUNCAN J KENNETH ET AL) 2 March 1993 (1993-03-02) figures 1,2A	1-11
A	GB 2 196 329 A (PRE MAC) 27 April 1988 (1988-04-27) the whole document	1-11
A	PATENT ABSTRACTS OF JAPAN vol. 017, no. 388 (C-1086), 21 July 1993 (1993-07-21) - & JP 05 068641 A (TOSHIBA CORP), 23 March 1993 (1993-03-23) abstract	1-11
-/-		

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

23 May 2000

Date of mailing of the international search report

02/06/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 851 epo nl,  
Fax: (+31-70) 340-3018

Authorized officer

Gruber, M

# INTERNATIONAL SEARCH REPORT

Int. Patent Application No.

PCT/US 00/01671

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 06, 30 April 1998 (1998-04-30) - & JP 10 043028 A (MARUYAMA GIKEN:KK), 17 February 1998 (1998-02-17) abstract	1-11
A	WO 96 13318 A (I CA LAVORAZIONE ITALIANA CASA ;MORETTO LEONIDA (IT)) 9 May 1996 (1996-05-09) abstract	1



# INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. J. Application No

PCT/US 00/01671

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4776956 A	11-10-1988	NONE	
US 5190643 A	02-03-1993	AU 3434093 A WO 9313847 A	03-08-1993 22-07-1993
GB 2196329 A	27-04-1988	NONE	
JP 05068641 A	23-03-1993	NONE	
JP 10043028 A	17-02-1998	NONE	
WO 9613318 A	09-05-1996	IT VI940156 A IT VI950024 A AU 701401 B AU 3925795 A BR 9509445 A EP 0788397 A JP 10509375 T PL 319877 A US 5900138 A	29-04-1996 12-08-1996 28-01-1999 23-05-1996 16-09-1997 13-08-1997 14-09-1998 01-09-1997 04-05-1999